

$$\frac{ED}{AE} = \frac{2}{8} = \frac{1}{4}$$

$$\frac{DF}{FC} = \frac{8}{2} = 4$$

$$\frac{DF}{FC} = \frac{BC}{AE} = 4 \rightarrow FC = 2, FA = 8$$

$$\frac{EF}{AF} = \frac{2}{8} = \frac{1}{4}$$

$$\frac{EF}{AF} = \frac{2}{8} = \frac{1}{4} \rightarrow EF = 2$$

$$AE = (x)^2 + (y)^2 = (8)^2 \rightarrow x^2 + y^2 = 64$$

$$AC = (x)^2 + (y)^2 = (10)^2 \rightarrow x^2 + y^2 = 100$$

$$100 - 64 = 36 \rightarrow 2xy = 36 \rightarrow xy = 18$$

$$x = 6, y = 3$$

$$\hat{A} = \hat{A} \Rightarrow \text{شبه مثلث}$$

$$\hat{E} = \hat{C} \Rightarrow \triangle AED \sim \triangle ABC$$

$$\frac{AE}{AC} = \frac{AD}{AB}$$

$$\frac{2}{10} = \frac{2}{10} \rightarrow 2 = 2$$

$$x = -4 \text{ و } 0$$

$$x = 0 \text{ و } 0$$

$$y = 2x$$

$$x = 2, y = 4$$

$$DE \parallel BC \Rightarrow \frac{AE}{AC} = \frac{DE}{BC}$$

$$\frac{2}{10} = \frac{2}{10} \rightarrow 2 = 2$$

$$BC = 2 + \frac{10}{2} = 7$$

$$HC = 2, AH = 8$$

$$BC^2 = HC \times AC \Rightarrow BC^2 = 2 \times 10 \rightarrow BC = \sqrt{20} = 2\sqrt{5}$$

$$AB^2 = AH \times AC \Rightarrow AB^2 = 8 \times 10 \rightarrow AB = \sqrt{80} = 4\sqrt{5}$$

$$\frac{AB}{BC} = \frac{4\sqrt{5}}{2\sqrt{5}} = 2$$

$$\hat{F}_1 = \hat{F}_2 = 90^\circ$$

$$\hat{A} = \hat{C} \Rightarrow \triangle AFB \sim \triangle EFC$$

$$\frac{CF}{AF} = \frac{EF}{BF}$$

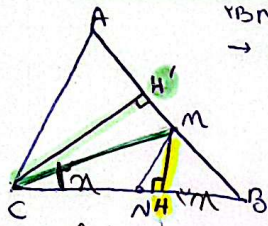
$$\frac{1}{1+EF} = \frac{EF}{4} \rightarrow 4 = 1 + EF + EF^2$$

$$(t+1)(t-1) = 0 \rightarrow t = 1 \text{ و } -1$$

$$t = 1 \rightarrow EF = 1$$

$$AF = AE + EF = 1 + 1 = 2$$

$$\frac{BN}{NC} = \frac{m}{r}$$



$$BN = NC \rightarrow \frac{BN}{NC} = \frac{m}{r}$$

$$S_{ABC} = 9m \cdot \frac{m}{m} = 9m$$

$$\frac{BM}{AM} = \frac{m}{r}$$

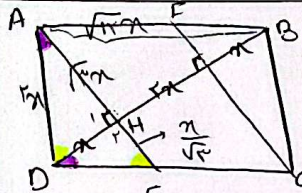
$$\frac{BM}{AM} = \frac{m}{r}$$

$$S_{MBC} = 2m$$

$$MH = h_{MNB}, h_{MCB} \rightarrow \frac{S_{MNB}}{S_{MCB}} = \frac{\frac{1}{2}MH \times BN}{\frac{1}{2}MH \times CB} = \frac{m}{m} = 1$$

$$S_{AMC} + S_{BMC} = S_{ABC} \rightarrow S_{AMC} + 2m = 9m \rightarrow S_{AMC} = 7m$$

$$\frac{S_{CMA}}{S_{CBM}} = \frac{\frac{1}{2}CH' \times AM}{\frac{1}{2}CH' \times MB} = \frac{AM}{BM} \rightarrow \frac{S_{CMA}}{S_{CBM}} = \frac{AM}{BM}$$



$$AH' = OH \times HB \rightarrow AH' = m \times (r+m) = mr \rightarrow AH = \sqrt{m}$$

$$\triangle AHD: (r+m)^2 + m^2 = 9m^2 \rightarrow AD = m$$

$$\triangle ABH: (r+m)^2 + (m)^2 = m^2 + 9m^2 = 10m^2 \rightarrow AB = \sqrt{10}m = r\sqrt{10}$$

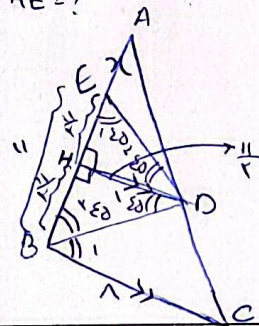
$$\angle A = \angle E = 90^\circ$$

$$\triangle AHD \sim \triangle EHE$$

$$\frac{OH}{AH} = \frac{HE}{EH} \rightarrow \frac{r}{\sqrt{m}} = \frac{HE}{m} \rightarrow HE = \frac{r}{\sqrt{m}}$$

$$S_{EHS} = \frac{1}{2} \times m \times \frac{r}{\sqrt{m}} = \frac{mr}{2\sqrt{m}}$$

$$AE = ?$$



$$EH = HB = HD = \frac{11}{r}$$

$$14m + m = \frac{11}{r} + 121$$

$$\frac{AE + \frac{11}{r}}{AE + 11} = \frac{40 \times \frac{11}{r}}{BC \times \frac{11}{r}} \rightarrow \frac{r+11}{r+11} = \frac{11}{11}$$

$$\alpha + \beta = 90^\circ$$

$$\angle A = \angle C = \alpha$$

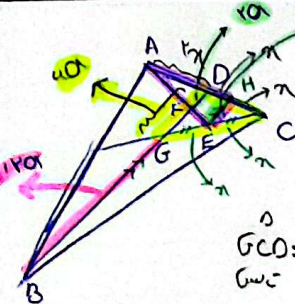
$$\angle B = \angle D = \beta$$

$$\triangle ABC \sim \triangle CDE \rightarrow \frac{EC}{AC} = \frac{ED}{BC} = \frac{CD}{AB}$$

$$\frac{EC}{AC} = \frac{ED}{BC} = \frac{CD}{AB} \rightarrow \frac{EC}{AC} = \frac{ED}{BC} = \frac{CD}{AB}$$

$$t = \frac{r}{r}$$

$$S = (r+t)^2 \rightarrow S = (r+t)^2 = 14 \times \frac{14}{r} = 10,14$$



$$AD = DC, GE = EC$$

$$\frac{AD}{AH} = \frac{FD}{EH} \rightarrow \frac{r}{r} = \frac{FD}{EH} \rightarrow FD = EH$$

$$\frac{CH}{HD} = \frac{CE}{EG} = \frac{m}{n} \rightarrow AD = DC = m$$

$$\frac{EH}{FD} = \frac{CH}{CD} \rightarrow \frac{EH}{FD} = \frac{CH}{CD}$$

$$GD = 40$$

$$GB = 2 \times 40 = 80$$

$$\frac{BD}{FD} = \frac{100}{20} = 5 \rightarrow \frac{BD}{FD} = 5$$

$$h^r = u \times r^u$$

$$\rightarrow h = \sqrt{r} a$$

$$A \hat{B} O \rightarrow h^r = u \times r^u \rightarrow h = \sqrt{r} u \quad (1)$$

$$S_{\square} = r \times S_{ABO} = \frac{r \times h \times r^u}{r} = \sqrt{r} u \times r^u = \sqrt{r} a^r$$

$$S_{\triangle} = \frac{h \times u}{r} = \frac{\sqrt{r} a^r}{r} \quad \frac{S_{\square}}{S_{\triangle}} = \wedge$$